

## SCREEN PRINTED FABRIC

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

5 The present invention is related to a printed fabric for applying a printed fabric pattern to an object and a method for making the printed fabric.

## 2. Background Art

10 The art of applying a printed fabric or an applique onto an object, such as a garment, has been done and continues to be improved. There are several ways known in the art of manufacturing and applying an applique to a garment. However, the industry has shown a need to provide a more cost and time effective applique and a way of making the applique without sacrificing the aesthetic value or materials thereof.

15 For example, an applique may be a laminate having a top layer and a bottom layer attached onto each other. The bottom layer may have an adhesive which may be applied onto a garment with heat or pressure. When applied onto the garment, the applique provides an appearance of stitching or embroidery of the applique onto the garment. In many situations, the cost and time effectiveness of attaching the layers together may be improved.

20 Some appliques are single layered having printed designs thereon. Such appliques are directly applied onto a garment, but in most situations do not provide an industry acceptable appearance of a laminate embroidered onto the garment.

25 The industry has also shown a need to improve ways of making printed fabrics, e.g. screen printed twills, which are to be applied onto garments. Currently, manufacturers of such printed fabrics are challenged due to mis-

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## SUMMARY OF THE INVENTION

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It is another object of the present invention to provide an applique which is single layered and provides an appearance of stitching of a plurality of fabric layers.

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Figure 1;

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to an object. The printed fabric pattern may be any suitable design desired by a user. In this example, the printed fabric pattern represents the numeral eight. Printed fabric 12 is a single layer fabric having a predetermined shape corresponding to the printed fabric pattern. Printed fabric 12 includes a plurality of portions printed thereon representing different shapes and pigments. Printed fabric 12 includes first and second portions 20, 22. First and second portions 20, 22 are adjacent each other. Printed fabric 12 further includes third portion 23 printed on both first and second portions 20, 22. Third portion 23 represents a simulated stitch appearing to attach first portion 20 to second portion 22. As shown, fourth portion is printed on first portion 20. Fourth portion 24 represents a simulated stitch hole to simulate an appearance of a hole through which the simulated stitch disposes. In turn, this simulates an appearance that first portion 20 is a top fabric layer stitched onto a bottom fabric layer which is represented by second portion 22.

As shown in Figures 1 and 2, first portion 20 has upper stitch portion 30 and second portion 22 has lower stitch portion 32 adjacent upper stitch portion 30. As shown, third portion 23 is printed on upper and lower stitch portions 30, 32 to simulate the appearance of stitching. First portion 20 has an outer periphery 34 which defines the outer shape of first portion 20. As shown, upper stitch portion 30 is adjacent outer periphery 34. First portion 20 includes an inner periphery 36 which defines an inner shape of first portion 20. Upper stitch portion 30 is also adjacent inner periphery 36, as shown.

As depicted in Figures 1-3, third portion 23 represents a simulated plurality of stitches to simulate an appearance of stitching a top fabric layer to a bottom fabric layer, represented by first portion 20 and second portion 22, respectively. Fourth portion 24 represents a simulated plurality of stitch holes which, in turn, simulate an appearance of holes through which the simulated stitches are disposed. As shown in Figure 3, printed laminate 10 has top and bottom sides 42, 43, wherein bottom side 43 has adhesive 16 disposed thereon to apply the printed fabric on the object. Printed fabric 12 may be made of any suitable material. For example, printed fabric 12 may be made of twill. Release paper 14 may be

made of any suitable material, such as Mylar™. The adhesive 16 may be any suitable adhesive known in the art. For example, adhesive 16 may be a heat-sensitive adhesive or a pressure-sensitive adhesive known in the art.

First portion 20 may be any desired shape and/or pigment. Second  
 5 portion 22 may also be any desired shape and/or pigment. For example, First  
 portion 20 may simply be a desired color printed on the area defined by outer  
 periphery 34 and inner periphery 36. In this embodiment, First portion 20 takes on  
 a numeral eight as shown. Then, second portion 22 may include a different pigment  
 and/or shape. In this embodiment, second portion 22 outlines the numeral eight of  
 10 first portion 20. The contrast in colors and shapes between the first and second  
 portions outline the predetermined shape corresponding to the printed fabric pattern  
 and provide a simulated appearance of multiple fabric layers positioned on top of  
 each other.

Third portion 23 provides a simulated stitch look by having a pigment  
 15 different than the pigment of either first portion 20 or second portion 22. However,  
 third portion 23 may have a shade of either first portion 20 or second portion 22.  
 Fourth portion 24 provides a simulated appearance of stitch holes through which the  
 simulated stitches are disposed. In this embodiment, this is accomplished by the  
 fourth portion 24 having a shade of second portion 22. This creates an appearance  
 20 that stitch holes are formed through first portion 20, the top layer, and that a shade  
 of second portion 22, the bottom layer, can be seen therethrough. This appearance  
 is often viewed when a top layer of fabric is actually stitched onto a bottom layer of  
 fabric. The color of third portion 23 should be different than the color of any of the  
 other colors since it is desired to highlight a pattern of stitches to simulate stitching  
 25 of a top layer onto a bottom layer. The color of the fourth portion 24 should take  
 on a shade of what would appear to be the bottom layer seen through a hole. In this  
 example, the bottom layer is second portion 22 which is adjacent outer periphery 34  
 and inner periphery 36.

However, other embodiments may include the reverse of what is  
 30 shown in the figures which would not fall beyond the scope or spirit of the present

invention. For example, in another embodiment (not shown), the top layer may take on the area represented by second portion 22 and the bottom layer may take on the area represented by first portion 20. In this example, the color of fourth portion 24 should be a shade of first portion 20 to represent stitch holes through which such colors would be viewed.

Figure 4 illustrates one method 110 of making a printed fabric 12 for applying the printed fabric pattern to an object. As shown, method 110 comprises providing an unprinted laminate or substrate for printing a design thereon shown in block 112. The substrate is a laminate having a fabric layer for printing the fabric pattern thereon, a release layer and an adhesive layer disposed between the fabric layer and the release layer, as described above. Next, method 110 includes cutting the unprinted substrate to form a predetermined shape corresponding to the fabric pattern and to form a registration hole on the substrate as shown in block 114. In this embodiment, the step of cutting includes "kiss-cutting" the laminate to cut only the fabric layer and the adhesive layer of the laminate. In this embodiment, the release layer is not cut. Also, the step of cutting may include cutting the substrate to form a plurality of registration holes on the substrate.

Method 110 further includes printing the fabric pattern on the predetermined shape of the unprinted substrate to define a printed substrate having the printed fabric pattern thereon in block 116. This step may include several printing steps based on the desired pattern on the printed fabric. In the embodiment shown in Figure 1, printed laminate 10 provides an appearance of two fabric layers placed on top of each other, simulating the layers being stitched together. Thus, in this embodiment, the steps of printing include printing a first portion on the fabric layer to form a simulated top layer, wherein the first portion has an upper stitch portion. Next, the method includes printing a second portion adjacent the first portion on the fabric layer to form a simulated bottom layer, wherein the second portion has a lower stitch portion adjacent the upper stitch portion. The method further includes printing a third portion on the upper and lower stitch portion to form simulated stitches having an appearance of attaching the top layer to the bottom layer. The method further includes printing a fourth portion on the upper stitch

portion to simulate stitch holes for an appearance of holes through which the simulated stitches are disposed. This provides an appearance of the top layer being stitched to the bottom layer.

5 It is to be noted that first portion 20 or any other portions 22,23,24 for that matter may take on the pigment of the fabric. In such event, the step of printing the respective portion would not be necessary and, thus, would not be performed. The remaining portions would be printed to outline the respective portion.

10 As depicted in block 118 in Figure 4, the method further comprises drying the printed substrate at a predetermined temperature and time period. In this embodiment, the predetermined temperature is between about 400° to 450° F and the time period is about 10-20 seconds. The predetermined temperature and time period may be varied to temperatures and time periods. These parameters typically, but not necessarily, shrink the printed substrate during drying.

15 The method as described above and shown in Figure 4 solves the problem of mis-calculated or mis-accounted shrinking of the substrate which, in turn, typically would result in misaligned cutting. The method allows the substrate to shrink after cutting is complete. It has been found that by cutting the unprinted substrate before printing avoids cutting miscalculations, thereby saving time and  
20 materials.

While embodiments of the invention have been illustrated and described, it is not intended that these embodiments illustrate and describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes  
25 may be made without departing from the spirit and scope of the invention.